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No. 668,771



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CANADIAN PATENT

Q. 128

RESPIRATOR FOR LARYNGECTOMIES

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No. OF CLAIMS 3

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This invention relates to a respirator for laryngectomies, that is, for those who can breath only through the neck, and others having tracheal afflictions, which can be used as a gas mask or as an oxygen breathing mask, the mask portion
5 being fitted in an air-tight manner to the neck of the laryngectomie.

In spite of the large number of laryngectomies in this country, estimated at 22,000, no suitable device exists for protecting them against poison gases, such as might be used
10 during warfare or against noxious vapors and fumes that accompany spray painting and other industrial occupations. Also no suitable emergency means exists for immediate administration of oxygen in case the laryngectomie faints from a heart attack or other ailment, inasmuch as con-
15 ventional oxygen tanks, such as used by firemen, policemen, etc, are not adaptable for a laryngectomie, therefore he must be taken to a hospital having an oxygen tent, which hospital may not be near by. Thus, in many instances, the patient may die before reaching the hospital.

An object of the present invention is to provide
20 a respirator or resuscitator which is particularly adaptable for use by laryngectomies and other neck breathers and which is devoid of the above named disadvantages, since it may form a component part of a respirator or oxygen breathing
25 device, such as normally used by firemen, policemen, and the like at the scene of an emergency.

A more specific object of the invention is to provide a novel respirator for laryngectomies and other neck breathers, including a mask or neck piece which can be fitted to the neck in an air-tight manner and adjusted to varying neck sizes and shapes and which includes an attachment for converting the respirator, when used as a gas mask, to one suitable for breathing oxygen from an oxygen tank, thereby providing great flexibility of use, for protection not only against noxious gases and fumes but in case of a laryngectomy being overcome or fainting from a heart attack, heat, smoke and the like, when oxygen must be administered immediately.

Other objects and advantages will become more apparent from a study of the following description taken with the accompanying drawing wherein:

Fig. 1 is a front, elevational view of a respirator for laryngectomies when used as a gas mask, wherein the respirator mask is applied to the neck of the neck breather and a gas mask canister 5 is worn on the belt;

Fig. 2 is a side, elevational view of the respirator mask of Fig. 1, shown enlarged;

Fig. 3 is an enlarged, fragmentary, elevational view of the connection between the canister 5 and flexible hose 4;

Fig. 4 is an exploded, perspective view showing the various parts of the inhalation valve 6 formed at the upper end of hose 4;

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Fig. 5 is an exploded view showing the various parts of the exhalation valve 7 at the side of the respirator mask, shown in Fig. 2, with parts shown enlarged and broken away to more clearly illustrate their construction; and,

5 Fig. 6 is a cross-sectional view of an adapter for attaching the lower end of hose 4 to a conventional outlet nozzle or valve of an oxygen tank.

Referring more particularly to Figs. 1 and 2 of the drawing, numeral 1 generally denotes a respirator mask or
10 neck piece for laryngectomies and other neck breathers, which is adapted to be fitted to the front portion of the neck in an air-tight manner. The mask comprises a substantially cup-shaped portion 1a having a generally triangular contour with the apex at the bottom and base in spaced parallel
15 relationship with the wearer's chin, and having a peripheral portion in the form of an outwardly bent marginal portion 1b. Portions 1a and 1b are of flexible material, such as rubber, and preferably in one piece. In order to provide adjustment for varying neck sizes and shapes, I prefer to add a
20 substantially U-shaped wire 1c whose ends pierce projections 1d on both sides of the apex of mask 1 to enable pinching together permanently, such sides, so as to reduce the lateral spread of the lower portion of respirator 1. Flexible strap 2 or 3, or both, may be secured by snap fasteners or other
25 suitable means to the side portions of the respirator mask for mounting it about the neck.

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A flexible hose 4, preferably of corrugated tubing construction, of rubber or other suitable flexible material, has one end 4b slip-fitted over neck 5a of a gas filtering canister 5 and clamped thereto by a clamp 4c of well known construction by tightening of a thumb screw, or the like.

At one side (or both sides) of cup-shaped portion 1a, there is mounted an exhalation valve 7, whose parts are shown in detail in Fig. 5, which comprises a valve seat 17 having a hub of U-shaped cross-section to fit snugly into a hole formed in portion 1a and having a central sleeve portion 17b into which is frictionally fitted a stem 18a of rubber or other suitable material, integrally formed at the center of a diaphragm disc 18 of thin rubber to form a valve. This exhalation valve will seat on the circumferentially and radially extending flanges or spiders emerging from sleeve 17b, so that the neck breather, upon breathing out, will flex the valve 18 away from the seat to permit air to flow outwardly through the peripheral openings 20 in the protective cover 19 of hard plastic material or metal.

An inhalation valve 6 is provided between the upper end of hose 4 and the cup-shaped portion 1a of the respirator mask 1, the details of which are shown in Fig. 4. More specifically, inhalation valve 6 comprises a tubular element 4a extending from the end of hose 4 and terminating in a ring portion 15 which is adapted to engage a corresponding ring portion 11 on tubular portion 10 which extends through

a hole in the screw cap 9, the internal threads 9a which cooperate with the external thread 16a of part 16. An inhalation valve 13, in the form of a disc of thin rubber or plastic, is provided having spring arms 14 which are adapted to be sprung into the interior surface 15 of element 4a. Thus as air is inhaled, diaphragm 13 will be flexed away from its seat to permit filtered air to enter cup-shaped portion 1a. When air is exhaled by the neck, diaphragm 13 is seated against the valve seat to prevent air being exhaled through tube 4, so that air can be exhaled solely through exhalation valve 7. The structure described so far is essentially a gas mask for protecting the wearer against poisonous gases, as well as noxious fumes and vapors accompanying painting or other industrial occupations.

For protection against dust only, corrugated tube 14 may be made of felt, paper or other dust filtering material, and made very short with a closed end, so that dust will be deposited on the outer wall thereof as air is breathed in therethrough. The filter may take the shape of bellows, instead, or perhaps the shape of a bag or other shapes which are conventional in the industrial respirator art.

The gas mask described above may be converted very easily and quickly for connection to an oxygen tank when a laryngectomy becomes the victim of a heart attack, or is overcome by heat, smoke or the like. This may be done by the use of an adapter 21 preferably of rubber or other flexible material, shown in Fig. 6, having a top portion 22 which is

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adapted to be slip-fitted into the interior of end portions
4b of tube 4 and having an integrally secured tubular portion
24 slip-fitted to the inside surface 23 of portion 22
and sealed to portion 22, so as to fit tightly about the
5 serrated outlet valve 25 projecting above the nut 26, which
is a conventional outlet valve of an oxygen tank (not shown).
An adapter, such as 21, is extremely inexpensive and may
be readily kept by firemen and policemen for conversion
purposes, together with a suitable respirator neck piece 1,
10 for administering oxygen to laryngectomie victims.

Thus it will be seen that I have provided an
efficient respirator for use by laryngectomies and other
neck breathers, which is useful either as a gas mask, or
for protection against dust and fumes, or which, by use
15 of a simple adapter, may be converted to a device for
administering oxygen from an oxygen tank, in jet planes
or in case of a heart attack or similar ailment by a
laryngectomie or other neck breather, useful either by
first aid personnel or as a more convenient means in the
20 hospital than an oxygen tent.

While I have illustrated and described a single
specific embodiment of my invention, it will be understood
that this is by way of illustration only, and that various
changes and modifications may be made within the contemplation
25 of my invention and within the scope of the following claims.

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I CLAIM:

1. A respirator for laryngectomies, comprising a flexible neckpiece of substantially cup-shape and of substantially triangular outline with the apex of the triangle at the bottom portion thereof and with the base of the triangle adapted to extend in spaced, parallel relationship underneath the chin of the wearer, and including an exhalation valve at the side thereof and an inhalation valve at the front thereof, said neckpiece including a marginal portion for forming an air-tight seal with the front portion of the neck of the wearer, and including strap means for mounting the neckpiece on the neck of the wearer.

2. A respirator as recited in claim 1, together with a flexible tube having its upper end connected to said inhalation valve, and a gas filtering canister connected to its lower end.

3. A respirator as recited in claim 1, together with a flexible tube connected to said inhalation valve, the lower end of said tube having a connection of flexible material which is adapted to be snugly slip-fitted onto the outlet valve of an oxygen tank, whereby oxygen may be administered to a neck breathing wearer.



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Fig. 1.

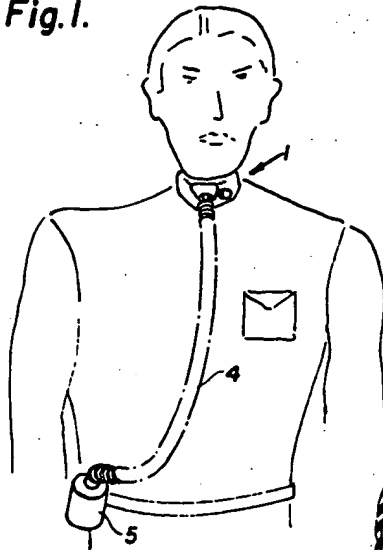


Fig. 2.

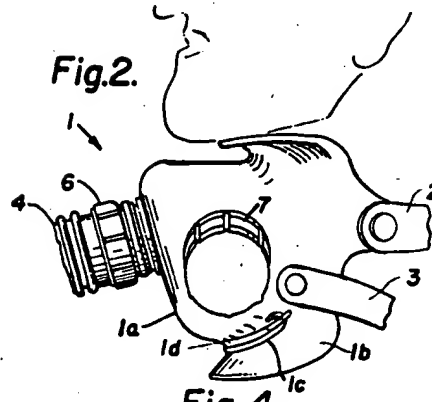


Fig. 4.

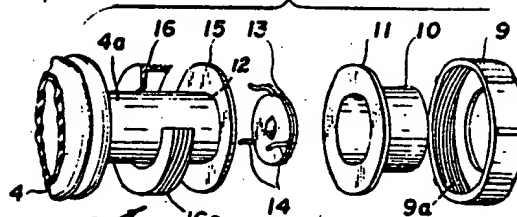


Fig. 5.

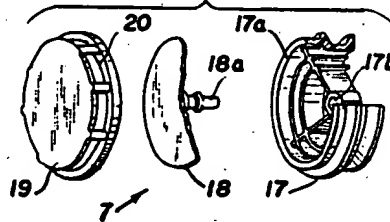


Fig. 3.

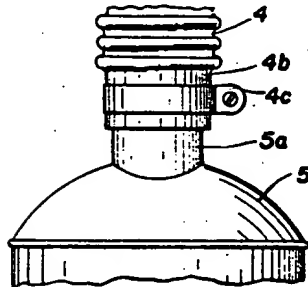
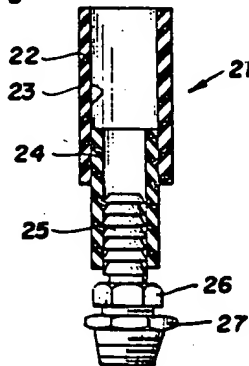


Fig. 6.



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